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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,959	11/21/2003	Geun Su Lee	30205/39514	4436

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EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/718,959

Applicant(s)

LEE, GEUN SU

Examiner

Sin J. Lee

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-7 is/are allowed.
- 6) ☒ Claim(s) 1-3,8 and 11-20 is/are rejected.
- 7) ☒ Claim(s) 9 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 3, applicants recite "photoresist polymer according to claim 1, *further* comprising a repeating unit of Formula 2 or 3:" By using the term "further", are applicants saying that the photoresist polymer of claim 1 comprises a repeat unit of the Formula 1 *and additionally* comprises the repeat unit of Formula 2 or 3, *or* are applicants simply narrowing the scope of Formula 1 by presenting Formula 2 or 3 (i.e., is Formula 2 or 3 more defined version of Formula 1)? If applicants meant the latter case, they need to delete "further" in claim 3.

Appropriate correction or clarification is necessary. For the purpose of examining the claim on the merit, the Examiner assumed that Formula 2 or 3 is more defined version of Formula 1.

Claim Rejections - 35 USC § 102

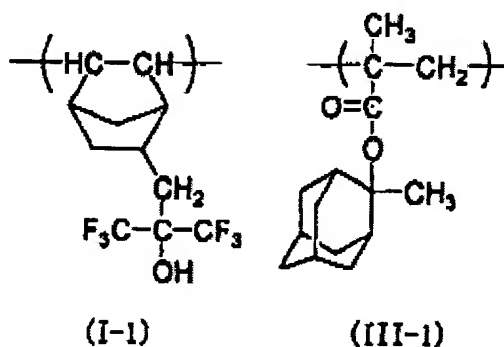
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3, 8, and 11-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishimura et al (EP 1 164 434 A2).

In Example 17 (see Table 1 of pg.54 and [0288]), Nishimura teaches a radiation sensitive resin composition containing 90 parts by weight of Resin A-23, 2.5 parts by weight of a photoacid generator, and 530 parts by weight of a solvent (propylene glycol monomethyl ether acetate). The Resin A-23 is described in [0277], and it has the following structure;



wherein the copolymerization molar ratio of the repeat unit (I-1) and (III-1) is 50:50. On pg.11, lines 30-53, Nishimura teaches the equivalence of the -CH₃ in the α-position of the repeat unit (III-1) and a hydrogen atom (see line 53 where it is stated that R⁶ represents a hydrogen atom or methyl group). Since there are only two choices for R⁶, one of ordinary skill in the art would immediately envisage the repeat unit (III-1) shown above in which the -CH₃ group in the α-position is replaced with a H atom. Therefore, the prior art teaches present photoresist polymer of claims 1 and 3 (since in the present Formula 1, c can be 0 mol% and present R₁ can be an acid labile protecting group of C₁₁ alkyl). Therefore, Nishimura teaches present inventions of claims 1, 3, 8, and 12.

With respect to present claim 11, since Nishimura uses 90 parts by weight of Resin A-23 and 2.5 parts by weight of a photoacid generator, this gives 2.8 wt.% of the photoacid generator based on the amount of the resin. Therefore, the prior art teaches present invention of claim 11.

With respect to present claim 13, since Nishimura uses 90 parts by weight of Resin A-23 and 530 parts by weight of the solvent, this gives 589 wt.% based on the amount of the resin. Therefore, the prior art teaches present invention of claim 13.

Nishimura teaches (see [0200]-[0204] and [0215]) that a resist pattern is formed from his radiation-sensitive resin composition by applying the composition solution to a substrate such as a silicon wafer to form a resist film, pre-baking the coated resist film, exposing it to radiation such as visible rays, UV rays, deep UV rays, X-rays, electron beams or the like (particularly preferable radiation being *ArF excimer laser* or *KrF excimer laser*), performing post-exposure bake at 90°C, and then developing the exposed resist film using an alkaline aqueous solution to form a predetermined resist pattern. Therefore, Nishimura teaches present inventions of claims 14-19 (since Nishimura teaches the same kinds of radiation source as the present invention, it is the Examiner's position that the prior art would inherently teach the present exposure energy range of claim 18).

With respect to present claim 20, Nishimura teaches ([0289]) that his radiation-sensitive resin composition is capable of producing semiconductors at a high yield without producing resolution defects during microfabrication. Therefore, the prior art teaches present invention of claim 20.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al (EP 1 164 434 A2).

In the Resin A-23 shown above, the repeat unit (III-1) has the 2-methyl-2-adamantyl group as the acid-labile group, and on pg.11, lines 30-50, lines 53-58, and [0066]-[0068], Nishimura teaches the equivalence of the 2-methyl-2-adamantyl group and t-butyl group (i.e., all R⁷ groups of the formula (4) on pg.11 are methyl groups). Because the prior art teaches the equivalence of these two groups, it would have been obvious to one of ordinary skill in the art to replace the 2-methyl-2-adamantyl group in the repeat unit (III-1) of Resin A-23 with a t-butyl group (as an acid-labile group) with a reasonable expectation of obtaining a resin composition exhibiting high transmittance of radiation, high sensitivity, resolution, and pattern shape. Therefore, Nishimura's teaching would render obvious present invention of claim 2.

Allowable Subject Matter

7. Claims 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Nishimura does not teach or suggest present photoacid generator of claim 9.

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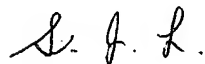
8. Claims 4-7 are allowed. Nishimura does not teach or suggest present method of forming the photoresist polymer of Formula 1.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333.

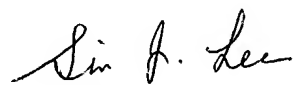
The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee
October 18, 2004



Sin J. Lee
Patent Examiner
Technology Center 1700